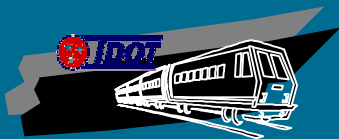

I-81 Corridor Multi-State Meeting

September 23, 2004

Diane Davidson

Tennessee Department of Transportation

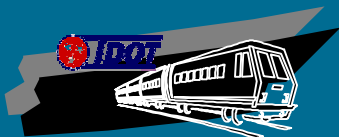
Division of Public Transit, Rail and Waterways



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Surrounding States



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Overview of Tennessee Railroads

Class I Railroads

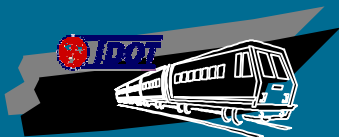
Six Class I Railroads serve Tennessee:

Burlington Northern Santa Fe	173 miles
Canadian National / Illinois Central	150 miles
CSX Transportation	1,137 miles
Kansas City Southern Railway	7 miles
Norfolk Southern	850 miles
<u>Union Pacific</u>	<u>18 miles</u>

TOTAL 2,335 mile

Short Line Railroads

20 Short Line Railroads with over 800 combined miles of track
Rail Rehabilitation Program



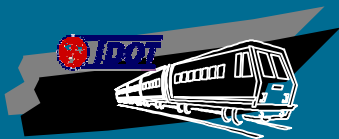
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Active Freight Network



2,700 miles active freight lines



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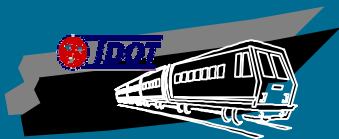
Freight Movement by Rail

1998

80 million tons of freight valued at \$33 billion was moved by rail.

2020

Expected to increase to 137 million tons



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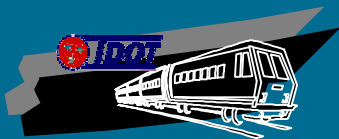
Future Freight Demand

Class I Railroads

- By 2020 rail traffic will increase by 73.9 percent over 1998 baseline levels
- Moderate 2.5 percent annual growth rate

Shortline Railroads

- By 2020 shortline rail traffic will increase 58% over 1999 baseline levels
- Reflects 2.2 percent annual growth rate



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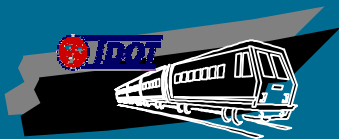


Trucking in Tennessee

Tennessee ranks 6th in nation for truck cargo ton-miles

Tennessee ranks 1st in the Southeast for truck cargo ton-miles

Annual tonnage equals about 370 million annual tons, of which 56% involves intrastate movement.

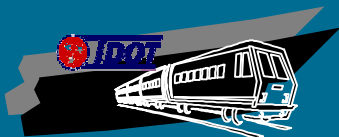
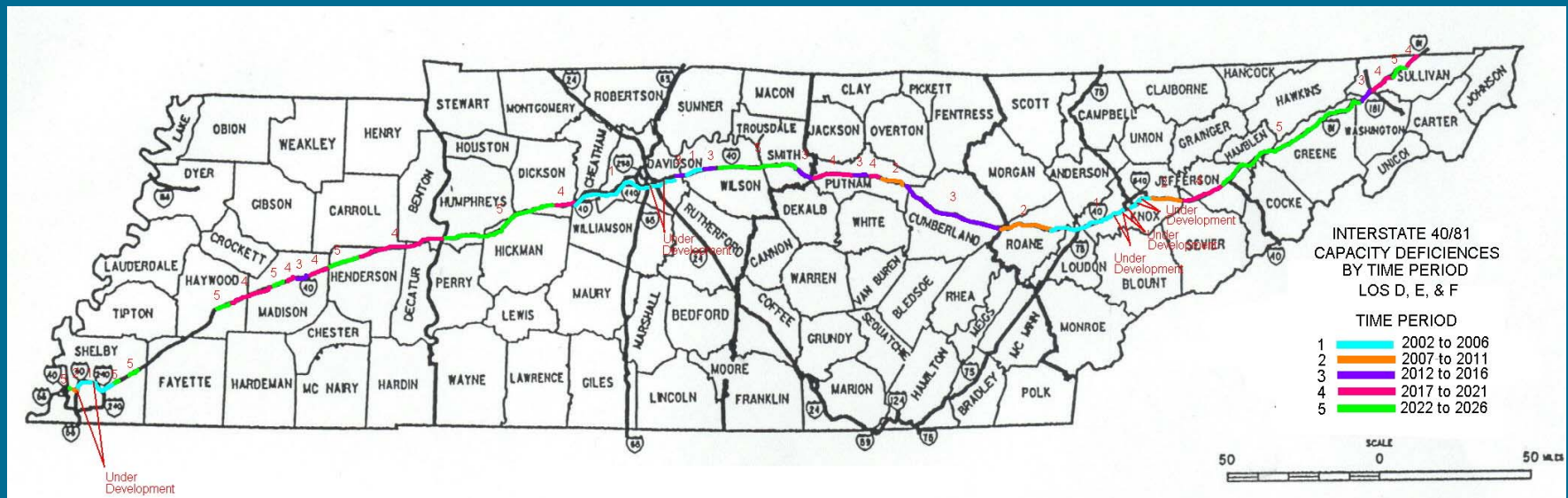


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Interstate 40/81 Capacity Deficiencies by Time Period

East TN Freight Diversion to Rail Gains Importance in 7 to 12 Yr Timeframe



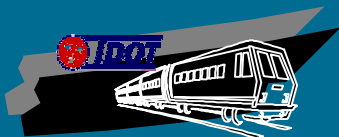
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Truck Diversion Scenarios in the 2002 Tennessee Rail Plan

Improve East-West corridor options

- (1) Basic Freight Rail Connection
- (2) Bristol-Memphis Connection



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Current East-West Rail Network



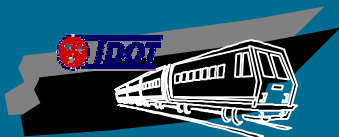
Legend

- Existing East-West Route
- Existing Rail
- City Limits



0 25 50 100 Miles

Carter-Burgess



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Basic Freight Rail Connection

Re-Establish Rail Link between Knoxville and Nashville



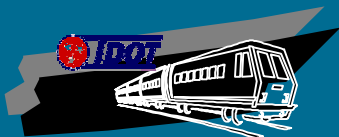
Legend

- Basic Freight Rail Connection Scenario
- Existing East-West Route
- Existing Rail
- City Limits



0 25 50 100 Miles

Carter-Burgess



TDOT Rail System



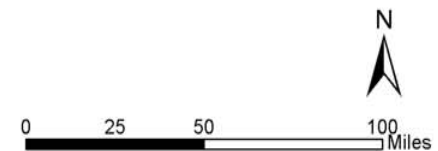
Bristol-Memphis Planning Horizon Connection

Improved East-West Rail Connection

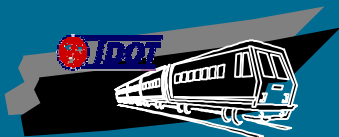


Legend

- | | |
|---|--|
| Proposed Connection | Proposed McKenzie Bypass |
| Proposed Intermodal Facilities | Planning Horizon Scenario - Northern Alignment |
| Proposed Rail Safety Congestion Relief Improvements | Existing East-West Route |
| | Existing Rail |
| | City Limits |



Carter-Burgess

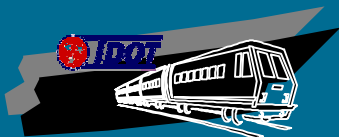


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Bristol-Memphis Connection

- Utilizes existing and new infrastructure
 - New alignment between Oliver Springs-Algood
 - Southern bypass of McKenzie
 - Centralized Train Control (CTC)
- Success Predicated On a Multi-state Approach
- Assumes: Investment program would be coordinated with Virginia and the Class 1 RR; much higher speed and capacity rail corridors connecting the Northeast with the gateway to the Western RR system at Memphis; and, connection the Northeast with Gulf Coast Ports



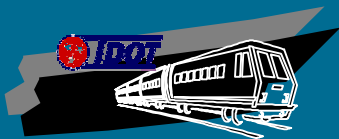
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Improvements by Segment

Five main segments

- Memphis to Nashville
- Nashville to Algood
- Monterey to Oliver Springs
- Oliver Springs to Knoxville
- Knoxville-Bristol



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Monterey to Oliver Springs Segment

- New rail corridor primarily follows State Route 62
- Segment east of Monterey will be composed of entirely new roadbed and track



Monterey to Oliver Springs Segment

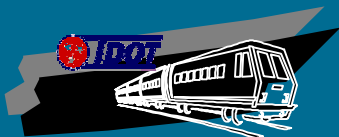
Alignment branches away from the existing roadbed east for approximately 53 miles connecting to the NS and CSXT

All of the proposed highway crossings will require a grade separation

A total of 105 road crossings were identified; majority at-grade crossings with fully gated, grade crossing signal configurations

A railroad grade separation will be necessary at the Norfolk Southern Harriman Junction to Lancing route

Proposed alignment will require a tunnel near Oliver Springs



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Knoxville-Bristol

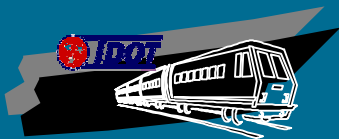
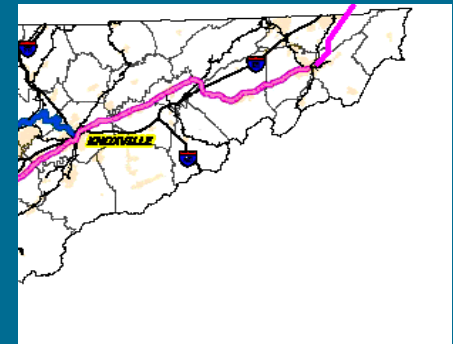
Identified by Norfolk Southern Railroad

Knoxville-Bristol

Create selective bi-directional signaled double track between Bristol and Bulls Gap, TN

South or West of Bulls Gap provide full bi-directional signaled double track where possible

Terminal improvements at Knoxville
Additional intermodal facility in the Knoxville region

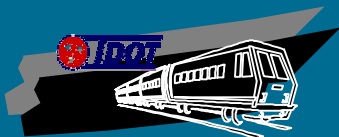


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NS Safety Improvements Chattanooga to Bristol

- Safety upgrades to mitigate existing as well as anticipated rail capacity issues associated with the proposed eastern Tennessee Intermodal Facility
- Help ensure that rail intermodal operations would be competitive with I-81 truck traffic
- Ensure safe operations with the reduction of truck traffic on I-81 and I-40



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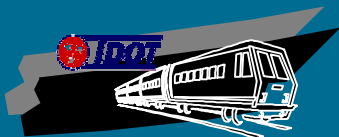
Cost

• Track and Signal Improvements	\$690,989,167
• Passenger Track & Signal	18,000,000
• Rail Passing Sidings	56,000,000
• Stations	18,500,000
• Rolling Stock	48,500,000
• <u>Maintenance Facility</u>	<u>10,000,000</u>

TOTAL CAPITAL COSTS

\$841,989,167

Note: Benefit-Cost Analysis considers the cost of the I-81 corridor improvements that would be located between Knoxville and the Virginia border is estimated at \$399 million



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Freight Movement Inventory Future Demand Analysis

Use of the all-Tennessee east-west rail link assumed that the primary source of the cargo to be diverted to the east-west rail link would be the cargo currently moved by truck on I-40.

Major expected benefit of the east-west rail link is to divert current truck cargoes on I-40 to rail to reduce truck traffic in both directions between Nashville and Knoxville.

The annual reduction of truck traffic estimates both new generated freight traffic and rerouted rail freight traffic related .

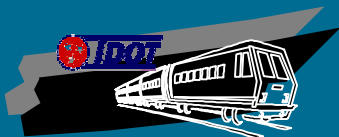
Data Sources:

FHWA Freight Analysis Framework (FAF) database.

Reebie & Associates used its TRANSEARCH 2000 database to develop specific truck traffic data for I-40 cargoes traveling between Nashville and Knoxville.

Reebie developed this data using its state-of-the-art truck model that is based in part on work developed by Oak Ridge National Laboratories Center for Transportation Analysis.

To augment the detailed statistical analysis of the potential use of the east-west connection, a survey was conducted of the Class I railroads and shippers that might potentially use the new east-west connection between Oliver Springs and Algood.



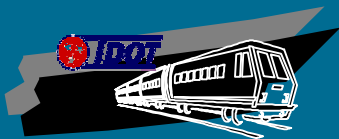
TDOT Rail System



Summary of Diverted Cargo

Summary of Cargo Potential for Basic Freight Rail Connection (Potential Diversion Cargoes Moving on I-40 During the Year 2000)

	Eastbound		Westbound		Total
	Tons	Truckloads	Tons	Truckloads	Truckloads
Cargo Transiting Tennessee					
Intrastate	373,228	18,629	349,161	17,696	
Interstate	903,470	68,022	413,617	28,009	
New Agricultural Products	None Identified		None Identified		
Total	1,276,698	86,651	762,778	45,705	132,356
Truckloads Diverted (25 percent of totals)	319,175	21,663	190,695	11,426	33,089
Rail Carloads					
Rail Carloads at 2.5 Truckloads per Rail Car		5,885		2,783	8,668
Rail Intermodal Units at 0.67 Truckloads per Intermodal Unit		10,372		6,668	17,040



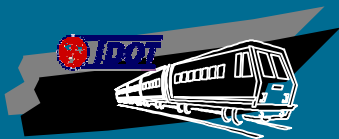
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Analysis of Results

- Projected diversion of 25% of the rail eligible cargo from the highway system in Tennessee, primarily identified as truck traffic on I-40, to the proposed rail alternative would result in benefit-to-cost ratio of 1.19

Results, while not very good, suggest value to further analysis of the rail system concept. Just beginning a follow-up study, to be conducted by UTK.



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Estimates of the Total Annual Economic Impact plus Induced Private Development for each identified Truckload diversion level

5% Diversion Level of truckload cargoes

Annual Economic Impact plus Induced Private Development: \$13,860,288

10% Diversion Level of truckload cargoes

Annual Economic Impact plus Induced Private Development: \$17,398,757

20% Diversion Level of truckload cargoes

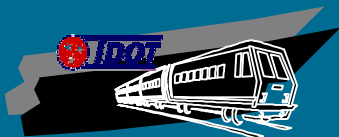
Annual Economic Impact plus Induced Private Development: \$24,475,695

30% Diversion Level of truckload cargoes

Annual Economic Impact plus Induced Private Development: \$31,552,633

40% Diversion Level of truckload cargoes

Annual Economic Impact plus Induced Private Development: \$38,631,867



TDOT Rail System



Estimated Annual Fuel Savings For each Diversion level

5% Diversion Level of truckload cargoes

Fuel Savings (gallons)	13,114,354
Fuel Savings (dollars)	\$19,671,532

10% Diversion Level of truckload cargoes

Fuel Savings (gallons)	26,228,709
Fuel Savings (dollars)	\$39,343,063

20% Diversion Level of truckload cargoes

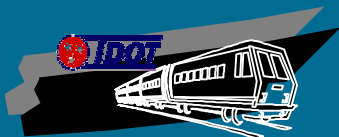
Fuel Savings (gallons)	52,457,418
Fuel Savings (dollars)	\$78,686,127

30% Diversion Level of truckload cargoes

Fuel Savings (gallons)	78,686,127
Fuel Savings (dollars)	\$118,029,190

40% Diversion Level of truckload cargoes

Fuel Savings (gallons)	104,928,451
Fuel Savings (dollars)	\$157,392,676

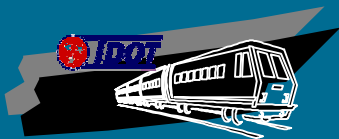


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Analysis of Results

- Diversion of between 5% and 10% of the cargoes on I-40 result in benefit cost ratios that exceed 1.0; 20% diversion - 2.34 b/c ratio
- Benefits are system-wide, derived from the transfer of freight from the highway system
- Analysis does not include the additional benefits or the costs from the State of Virginia I-81 corridor improvements
- Results suggest great value to further analysis of the multi-state rail system concept



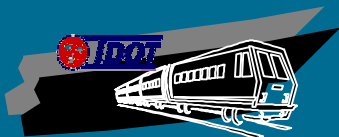
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Opportunities for Passenger Rail

Integrate passenger rail planning with statewide freight rail planning

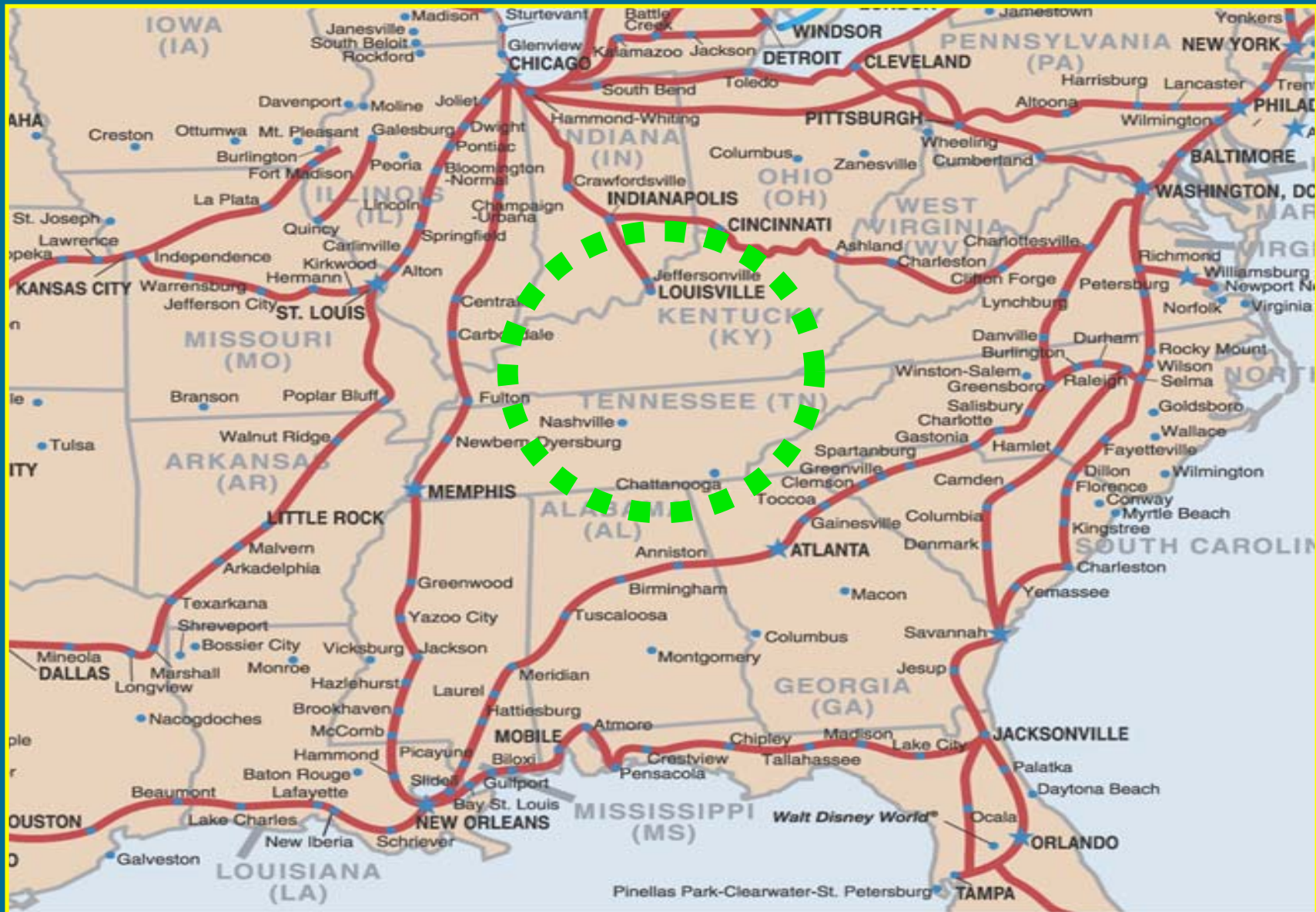
- **Tennessee is underserved by passenger rail**
- **Extensive state railroad network exists**
- **Rapid population growth in state**
- **Neighbor states are making rail plans**
- **Potential to expand tourism market**



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Passenger Rail Network



Percent Change in Population, 1990 to 2000



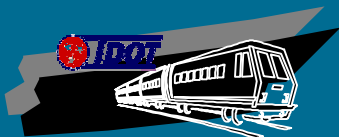
0 to 12 %

12 to < 20 %

20 to < 28 %

28 to < 35 %

35 % and up



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Corridor Selection Process

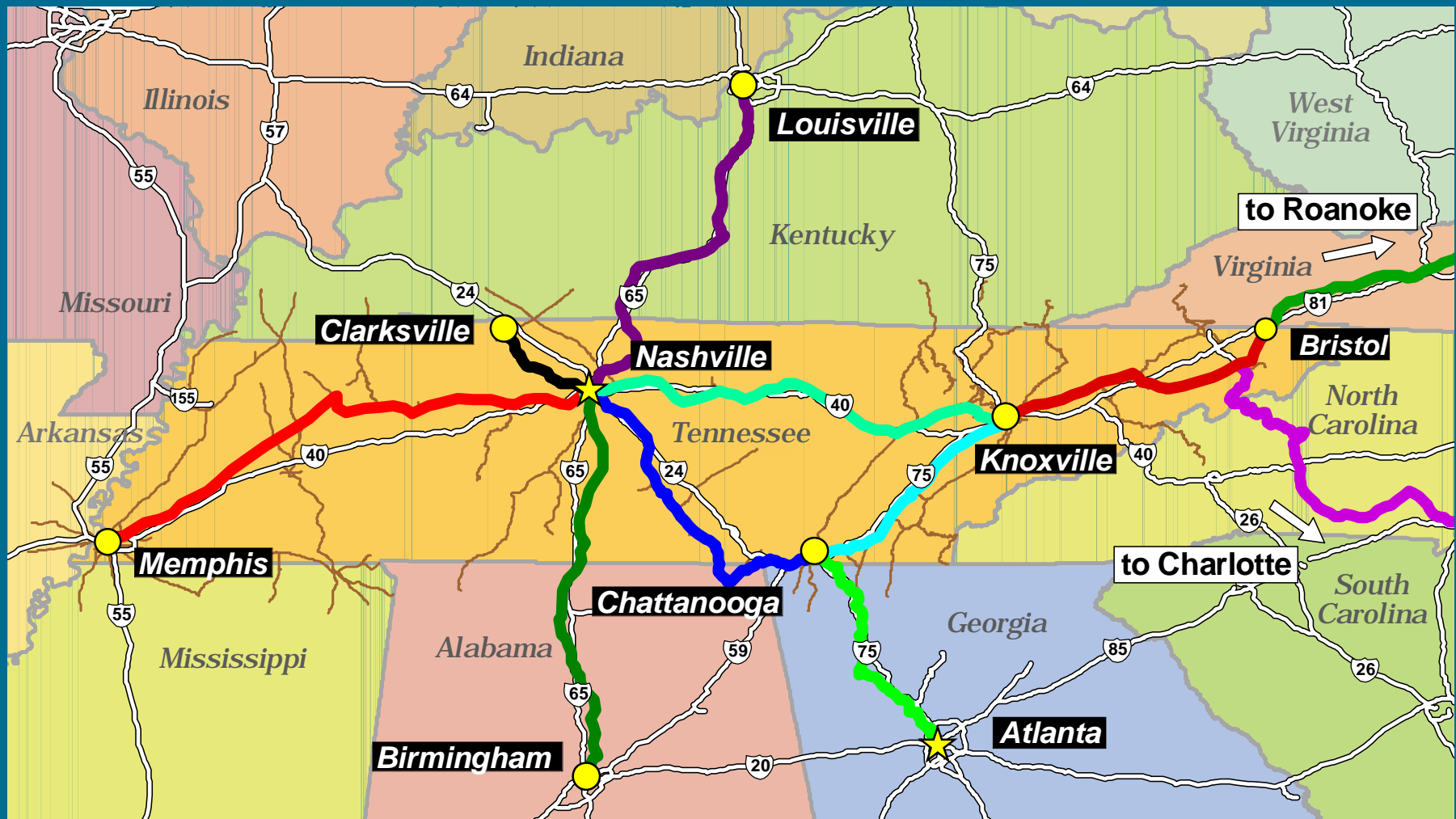
- Develop Long List of Corridors (11)
- Screen for Short List of Corridors (6)
- Combine corridors for practical routes or Most Promising Corridors (4)





Tennessee Rail System Plan

"11" Long Listed Corridors



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Tennessee Rail System Plan

"11" Long Listed Corridors



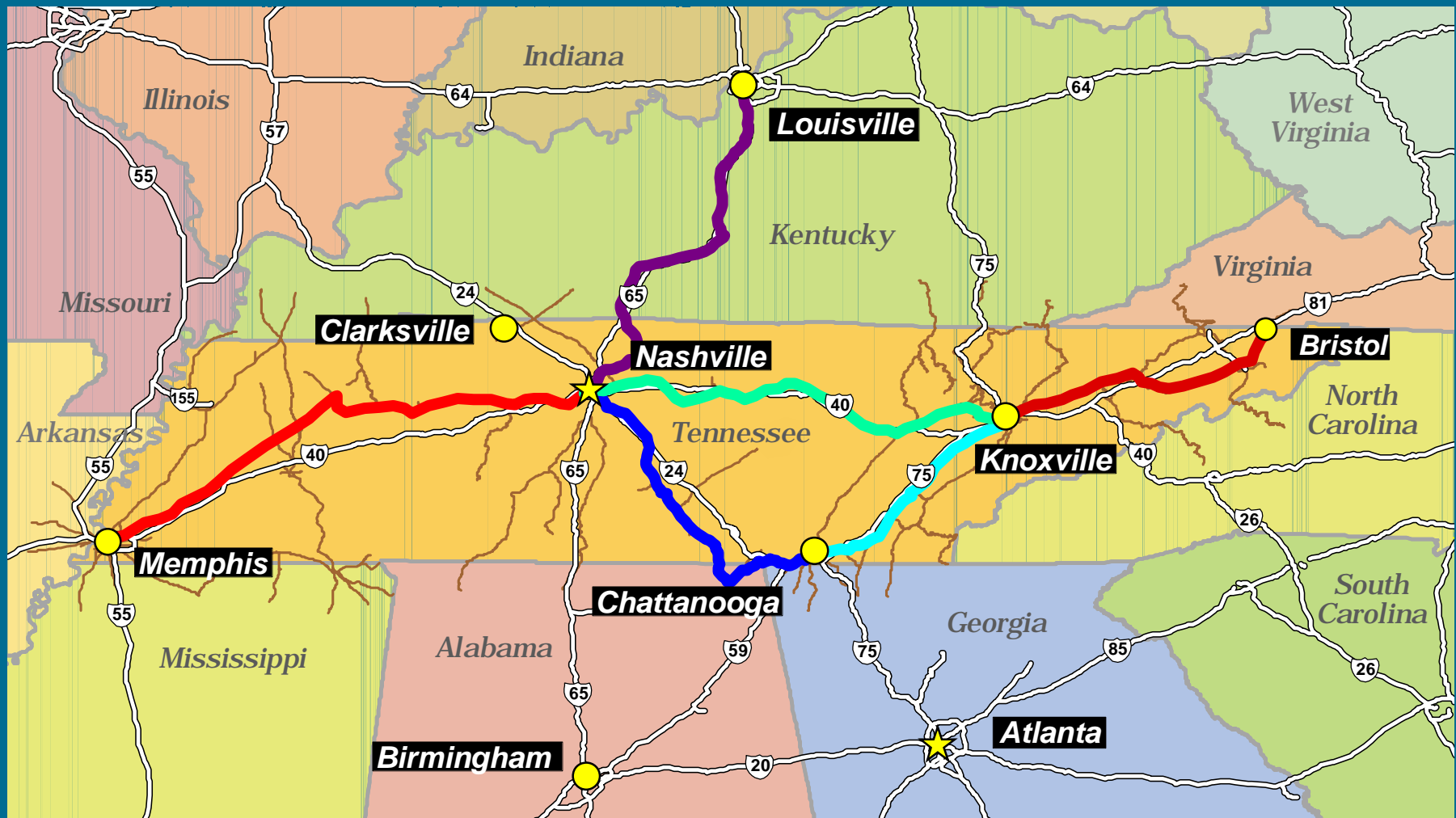
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Tennessee Rail System Plan

"Six" Short Listed Corridors



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Most Promising Corridors



Memphis-Nashville-Bristol Passenger Rail Population and Capital Costs

Population Served by Corridor (2000)

Memphis-Nashville	2,671,000
Nashville-Bristol	2,701,000
Chattanooga-Bristol	<u>1,977,000</u>
	7,349,000

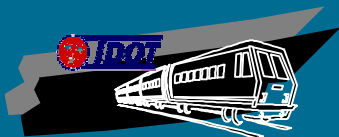
Benefit Cost Ratio

Memphis-Nashville	1.11
Nashville-Bristol	1.07
Chattanooga-Bristol	.64

Capital Costs Categories Summary

(Track and Signals, Passing Sidings, Stations and Rolling Stock)

Memphis-Nashville	\$ 93.8
Nashville to Bristol	\$115.8 million
Chattanooga to Bristol	<u>\$121.8 million</u>
	\$331.4 million

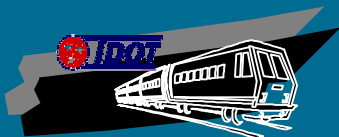


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Summary

- Freight Rail investments are justified based on: increasing truck traffic; highway congestion; and, availability of rail system parallel to I-40, I-81, I-24.
- Significant diversion of truck to freight will depend on multi-state cooperation.
- Integrate Passenger rail planning with statewide freight rail planning. Passenger Rail investment will be justified on population growth; increasing travel demand; and, highway congestion. Intercity Passenger rail is viable in 30 year period in the Bristol to Nashville to Memphis corridor



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